The HMT-West Legacy Project: Current Status & Future Plans

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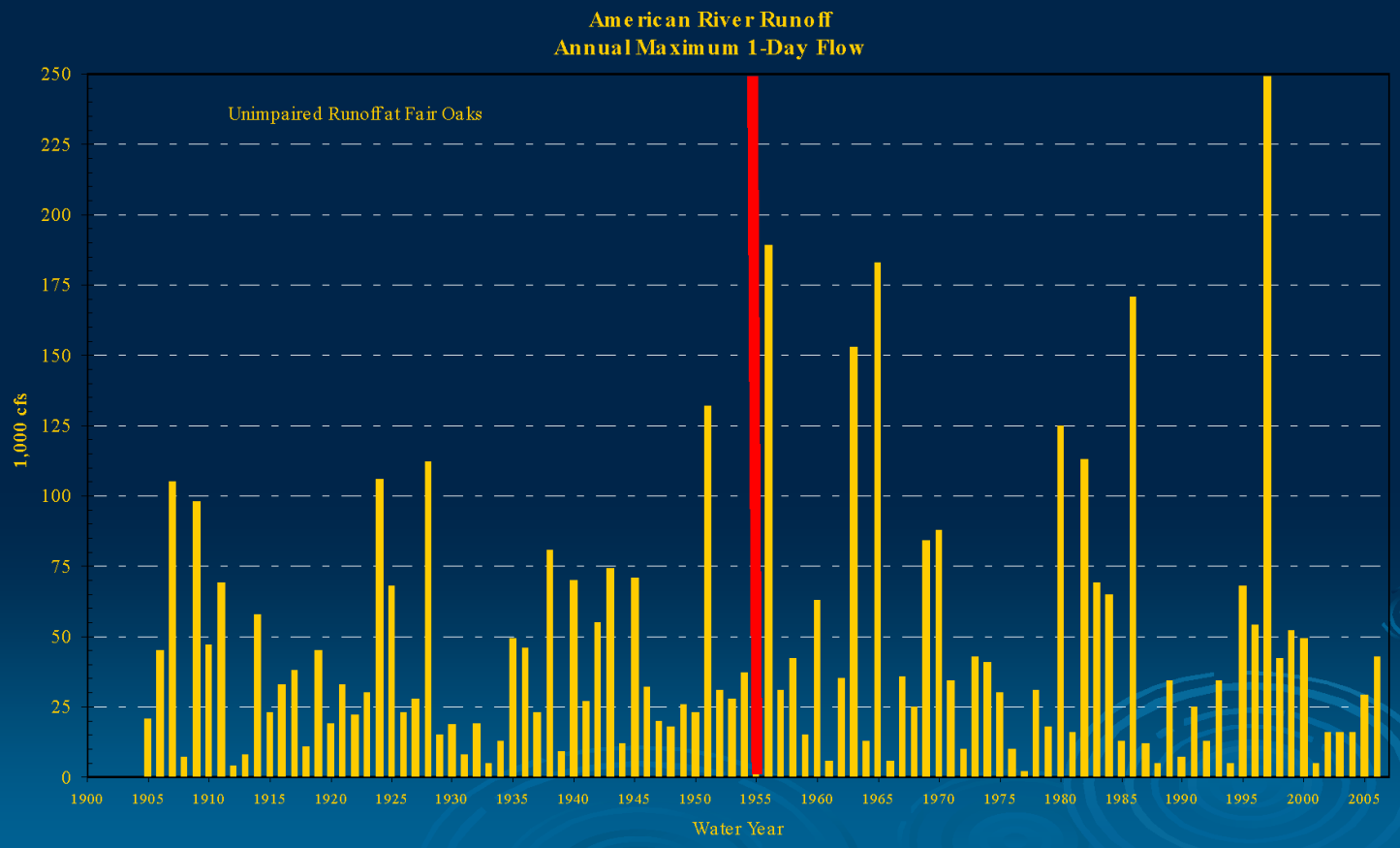
A Different Flow Regime in the American River Basin?

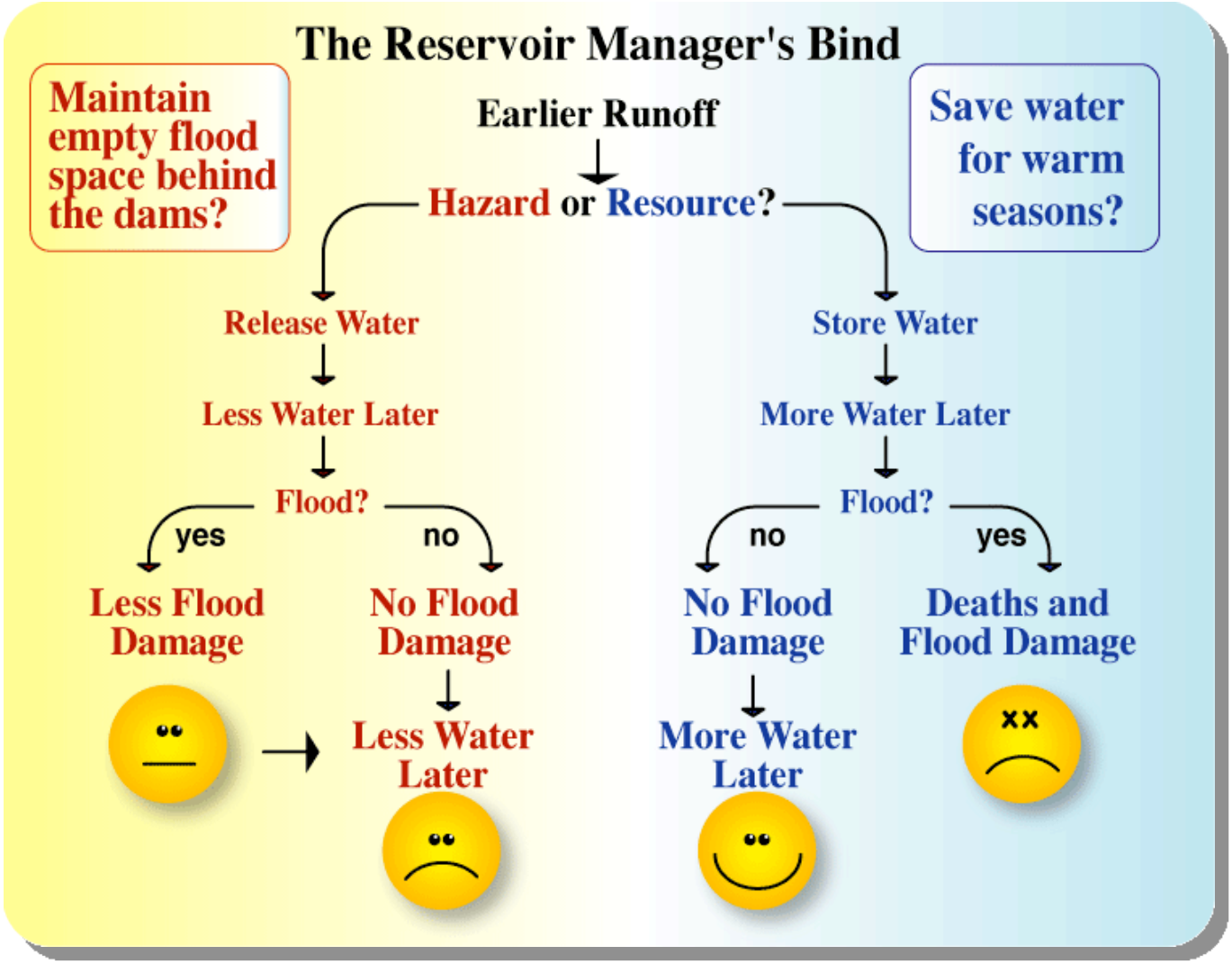
Changes in Peak Flows
American River



Red Line = Construction of Folsom Dam

Lester Snow, CA-DWR

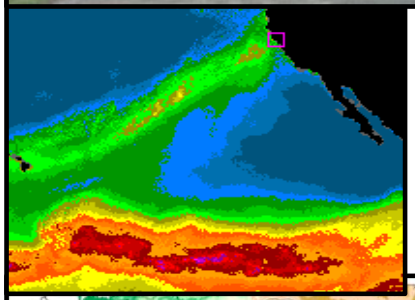
Climate change may put some water managers in a real bind!

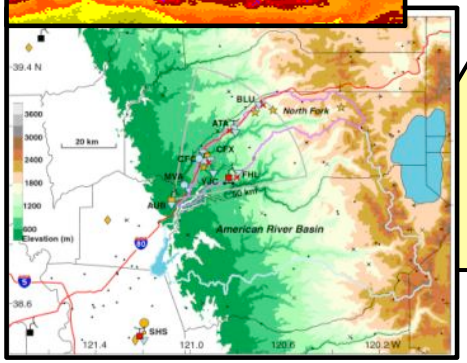


--> Storage & transferability of water supplies will thus be at a premium.


HMT Legacy Project is Informed by 10+ Years of ESRL Field Programs and Research Devoted to Hydrometeorology:
CALJET (California; 1998)
PACJET (U.S. West Coast; 2001-2003)
IMPROVE-2 (Oregon Cascades; 2001)
CSP Pacific Northwest Pilot (Oregon Coast; 2003-2005)
HMT Pilot (Russian River, CA; 2004-2005)
CSP Southern California Pilot (2006-2008)
Debris Flow (CA; 2006-2007, 2009)
HMT-West (American River, CA; 2006-2011)
CalWater (2009-2011)
HMT-Northwest (Washington; 2009-????)
HMT Legacy Project (2008-2013)

HMT Legacy: Observing System Enhancements





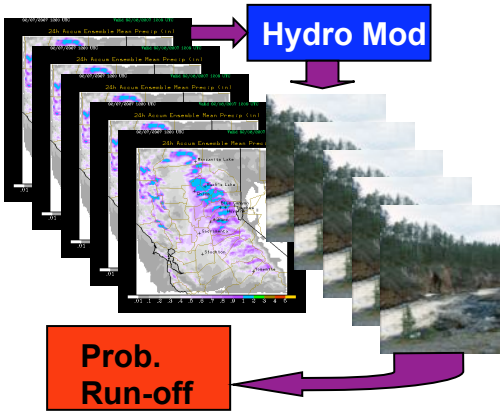
IV: Off-shore recon.

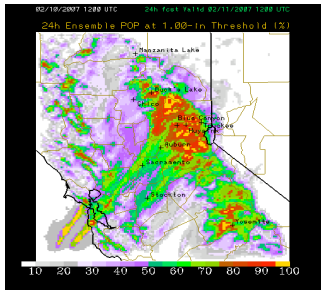
Tier III:
Newer technology
Ex: Gap-filling radars, Buoy-mounted WPs

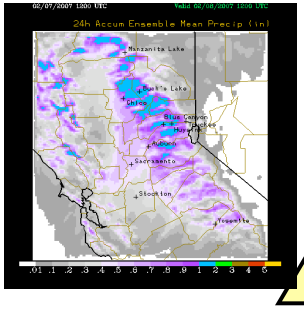
Tier II: Expand on well-defined needs with proven technology
Ex: Wind profilers, Coastal Atmospheric river observatory

Tier I: Address well-defined needs with proven technology
Ex: Soil moisture sensors at CIMIS sites, GPS receivers of opportunity, snow-level radars

HMT Legacy: Modeling, Display, and Decision Support Tools







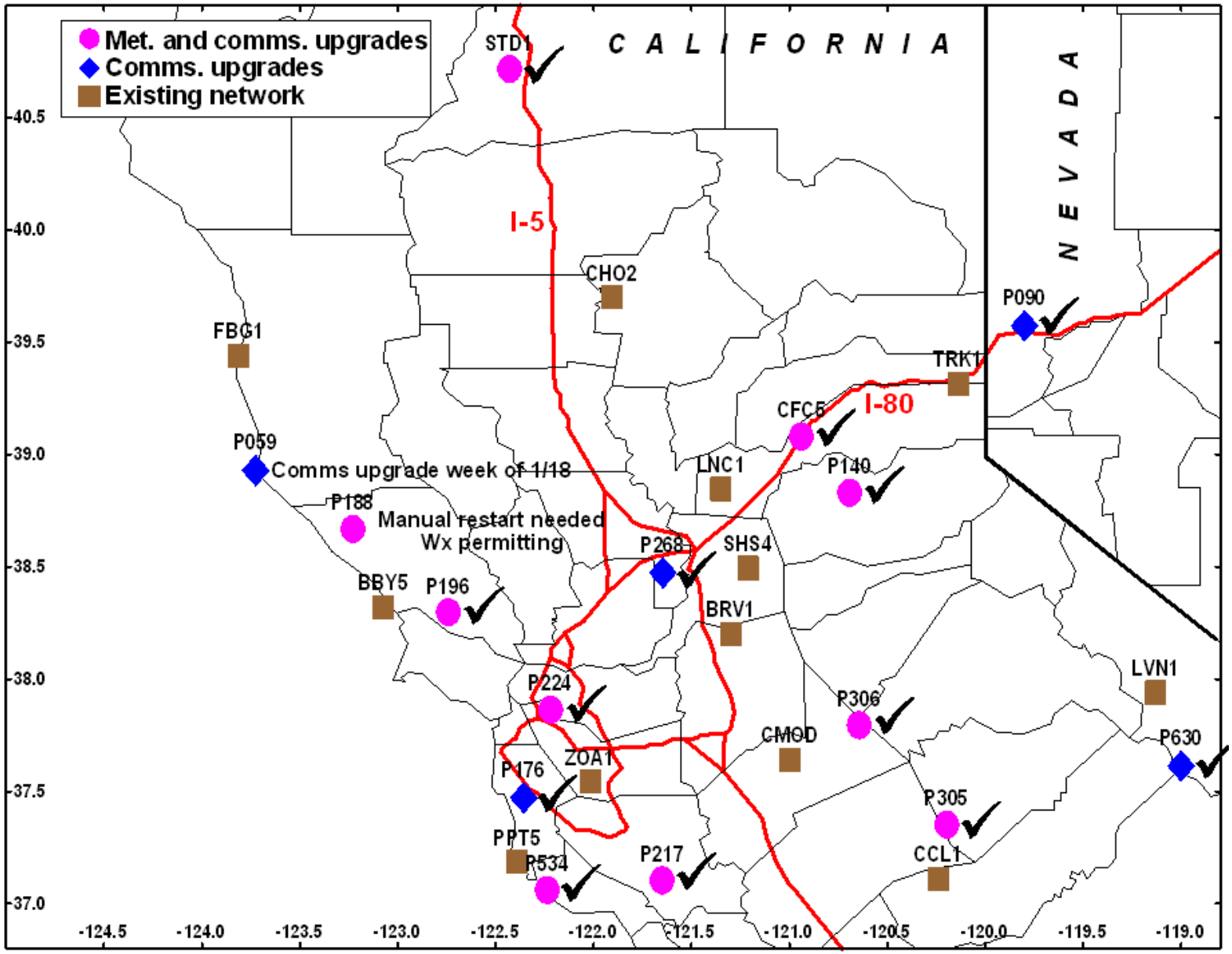
IV:
FBO/
FCO
HydroMet
driven system

Tier III:
Probabilistic hydro forecasts
Data assimilation of offshore observations
Hydro-forecast linking to FBO/FCO decisions

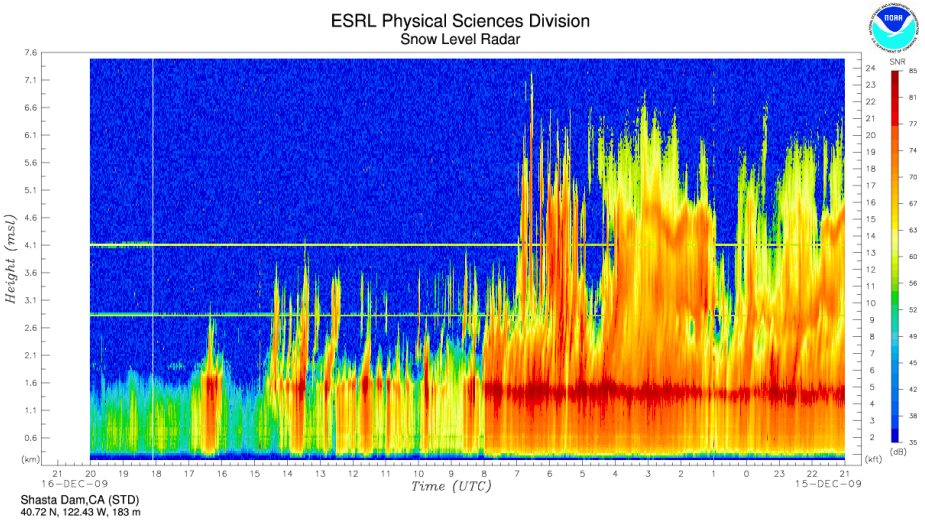
Tier II: Distributed (NWS) hi-Res local Models/hardware
National (low-res) and experimental (hi-res) probabilistic forecasts/hydro forecasts
Advanced data assimilation of HMT observations
Advanced verification methods

Tier I: Observation-based forecasting techniques
National product suite
Experimental hi-res/down scaled modeling
Basic model verification
Reforecasting techniques

First 15 out of 36 planned new GPS sites to measure IWV

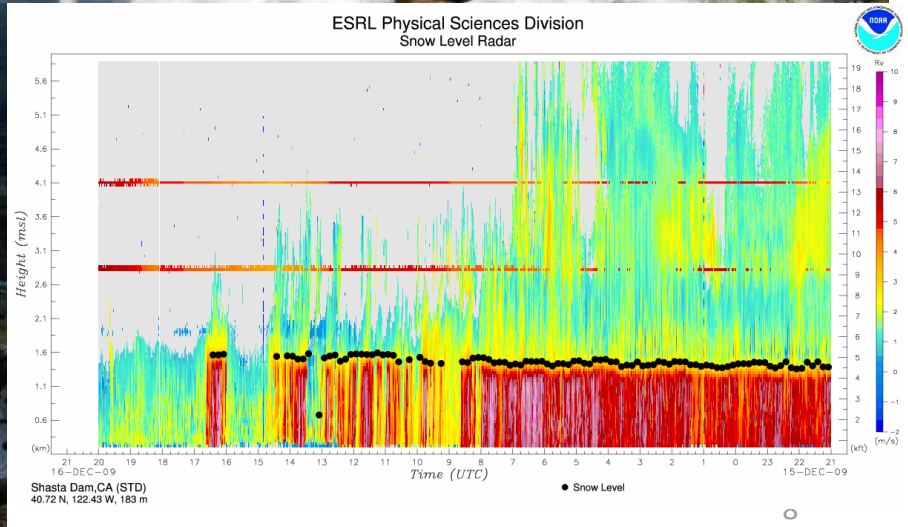


First 2 out of 10 planned new snow-level radars

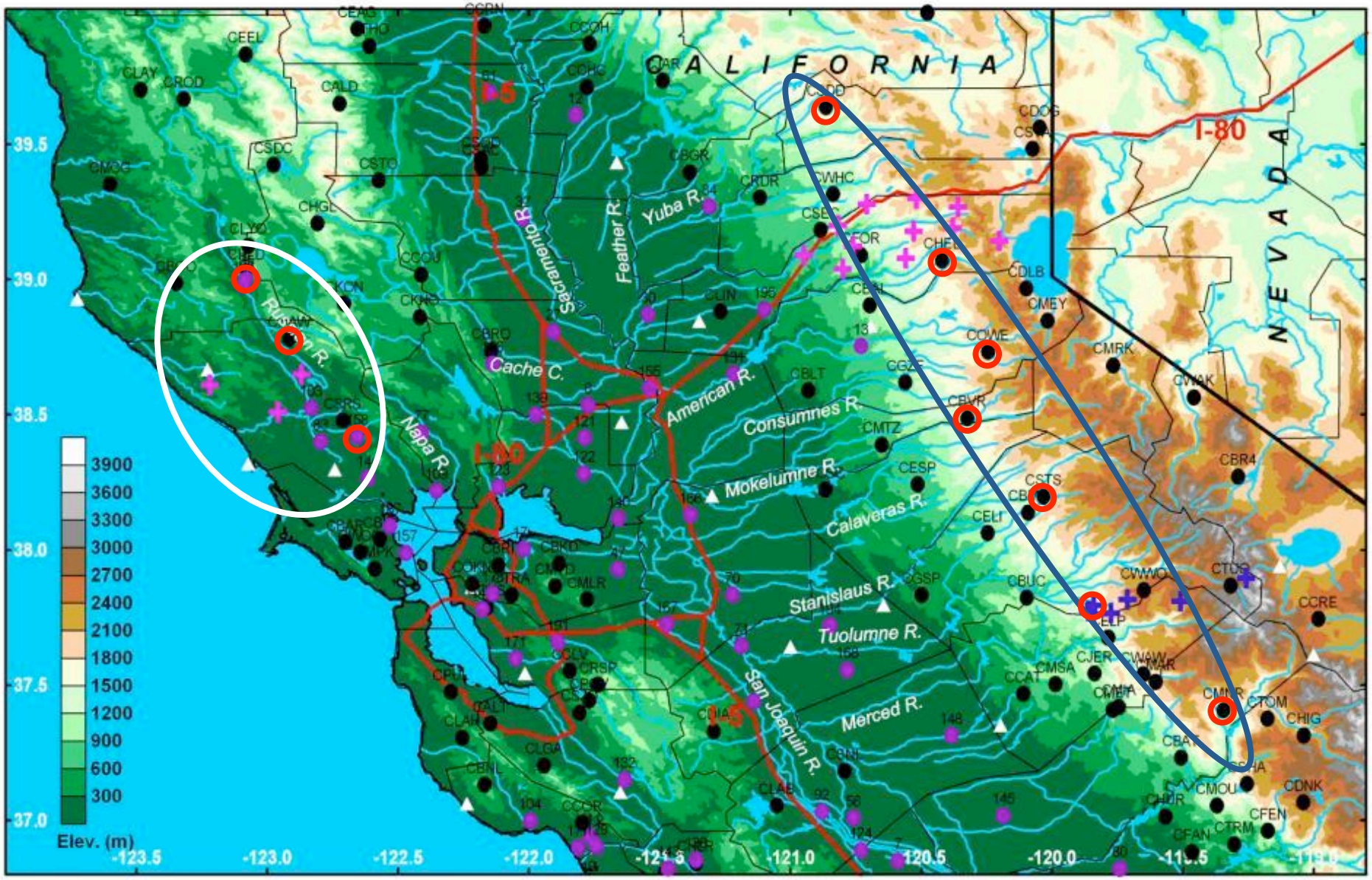


Snow-level Radar above Folsom Dam at Colfax

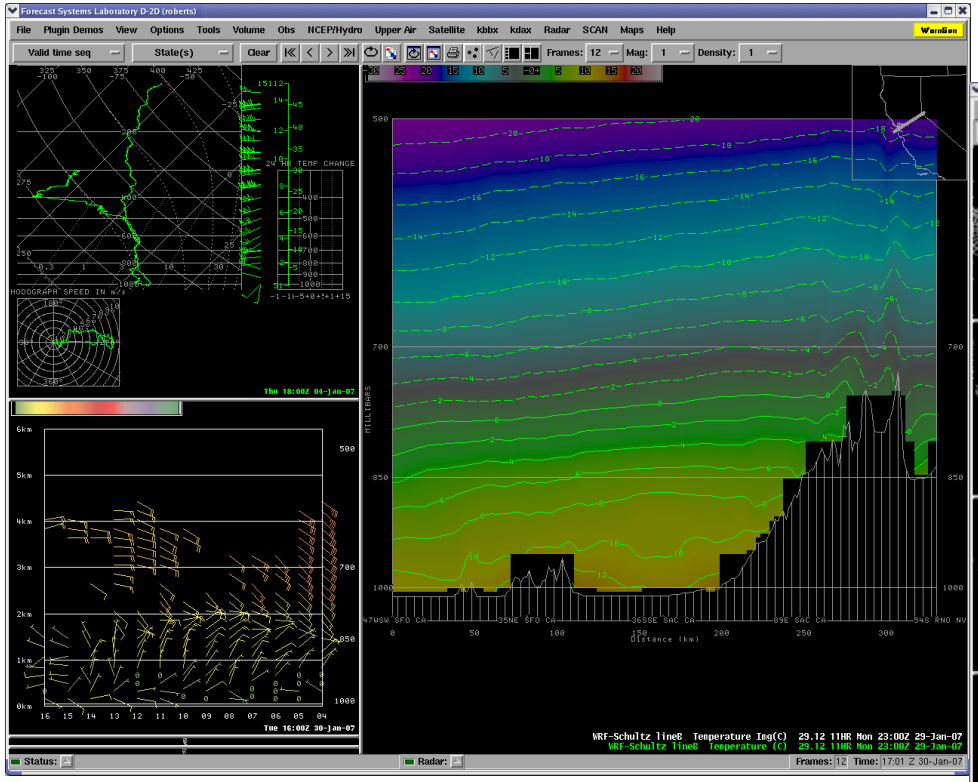
Snow-level Radar at Shasta Dam



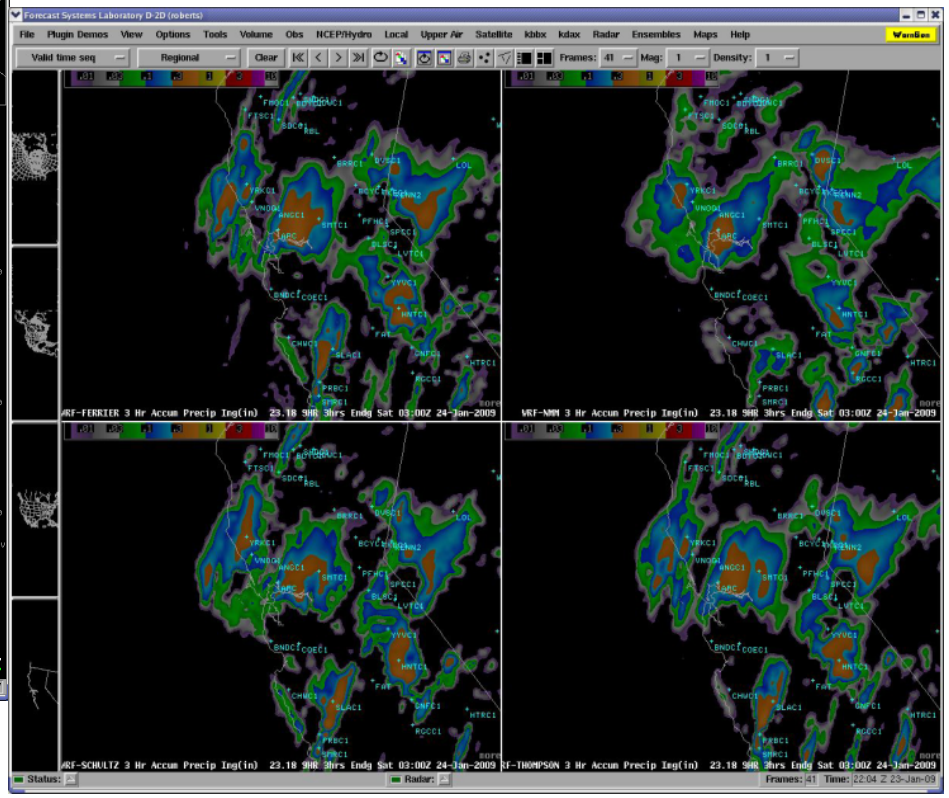
First 10 out of 43 planned new soil moisture sites identified



Advanced (AWIPS-like) LINUX Workstations (ALPS) successfully developed and deployed to several WFO's and an RFC.

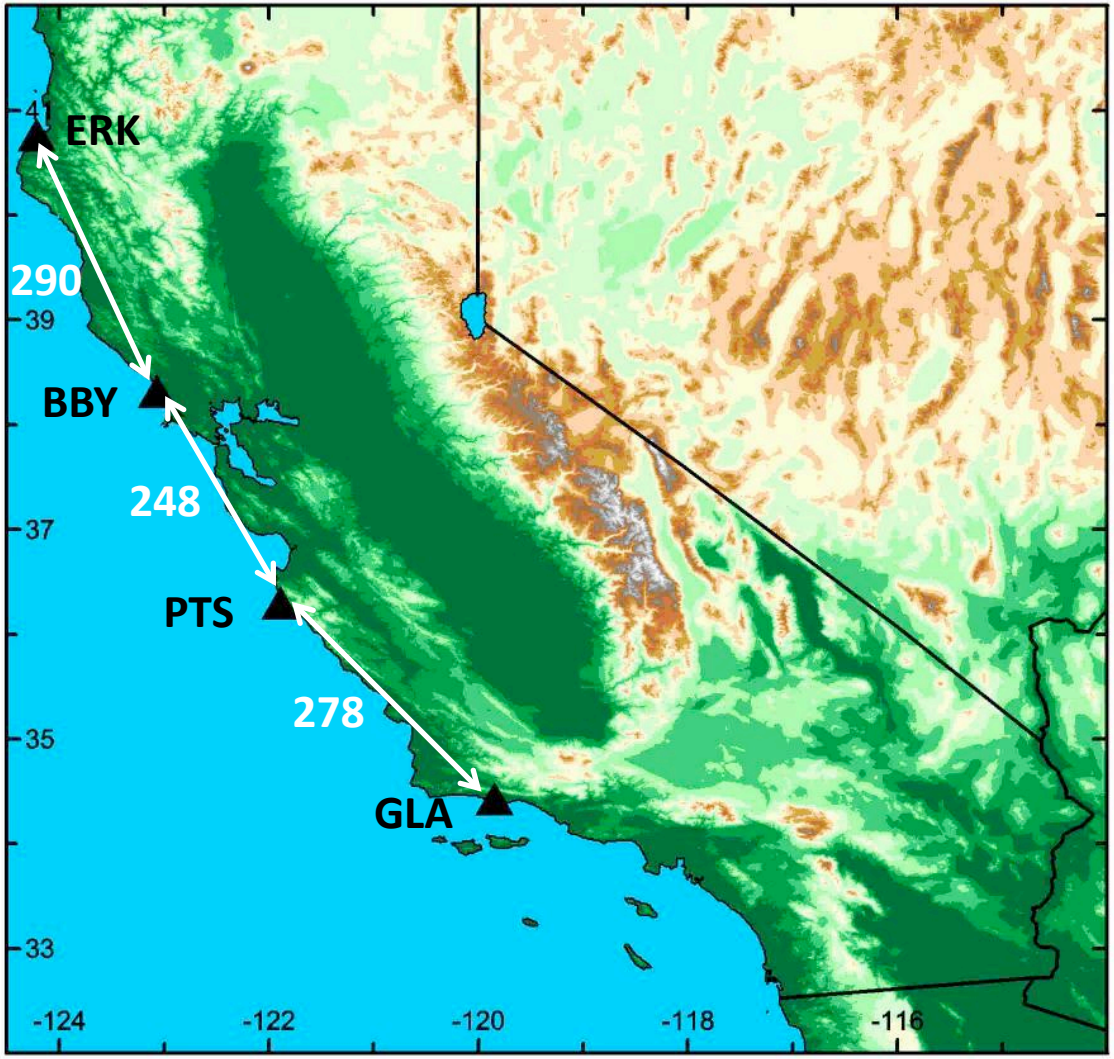


MADIS-provided rawinsonde sounding, boundary layer profiler, and ensemble model cross section display on ALPS.

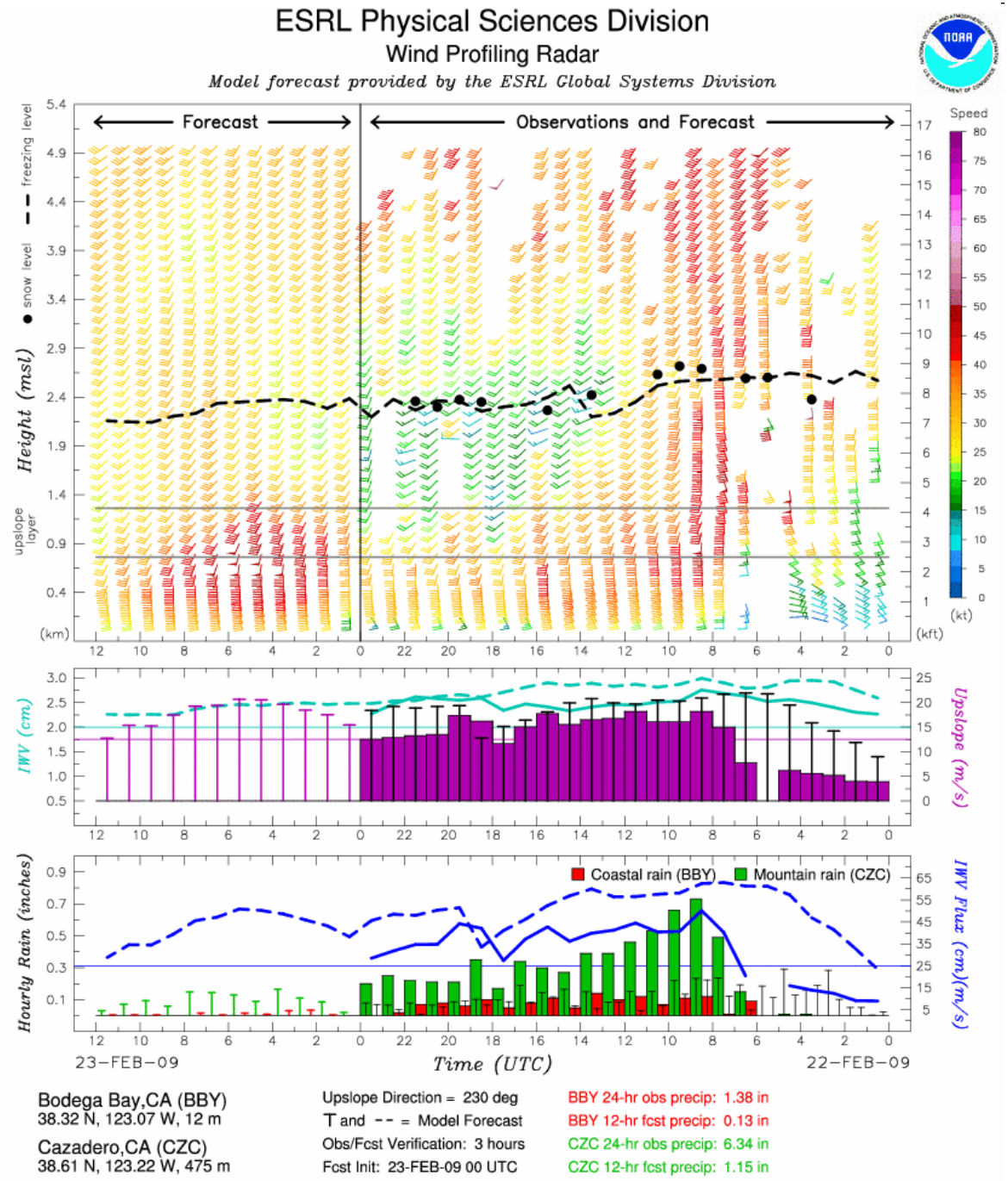


Four-member ensemble precipitation display on ALPS.

Agreed upon Tier II implementation plan has four partial Atmospheric River Observatories (AROs) at or near Eureka (ERK), Bodega Bay (BBY), Pt. Sur (PTS), and Goleta (GLA), which provides these ARO spacings (km)



Partial ARO Equipment



Partial ARO provides all measurements necessary to generate the atmospheric river water vapor flux tool. Numerical forecast model output is provided by ESRL/ GSD.

2009 Bronze Medal Awarded to

Daniel J. Gottas
Seth I. Gutman
Paul J. Neiman
David R. Reynolds (NWS)
Allen B. White

For innovative contributions to the development of the Coastal Atmospheric River Monitoring and Early Warning System.

Summary

- NOAA/ESRL has signed a 5-year MOU with CA-DWR (2008-2013).
- Several scientists and technicians at SIO are coconspirators.
- The project is bringing 21st-century observation, display, modeling, and decision support capabilities to bear on the state's water resource and flood protection issues.
- High resolution WRF ensemble models are run over an expanded west coast domain and results are displayed at several WFO's and the CA-NV RFC using the Advanced Linux Prototype System (ALPS) display system developed at NOAA/ESRL.
- The building blocks for eventual decision support tools are being developed, including an atmospheric river threat index.
- The project will benefit other end users including state and local emergency managers, farmers, fire responders, CDOT, and the public for both recreation and public safety.